

Supporting Information

Fabrication of Z-scheme MoS₂/CuO heterojunction for enhanced 2-Mercaptobenzothiazole degradation activity and mechanism insight

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2.5.1 Photocatalytic and trapping experiments.

The photocatalytic activities of the as-prepared photocatalysts are measured by the decomposition of MBT (10 mg L^{-1}) under visible light (300 W Xenon lamp with a 420 nm cutoff filter) irradiation. Before irradiation, 50 mg photocatalyst is added to 100 mL solution containing 10 mg MBT and stirred for 30 min to achieve adsorption/desorption equilibrium in the dark. After balance, 5 mL of the suspension is drawn every 20 min interval during lighting. In addition, the experiment of trapping active substances is the same as the photocatalytic experiment mentioned above. Various free radicals can be captured by adding 1 mL triethanolamine (TEOA, h^+ quenching agent), 1 mL isopropanol (IPA, $\cdot\text{OH}$ quenching agent) and 0.176 g Vitamin C (Vc, $\cdot\text{O}_2$ quenching agent) respectively before degradation experiment. The absorbance of MBT solution is determined using an UV-vis spectrophotometer.

2.5.2 Photoelectrochemical measurements

The photoelectrochemical property of the Z-scheme MoS_2/CuO heterojunction is investigated by the photocurrent response and electrochemical impedance spectroscopy (EIS) in a 450FRA 2A electrochemical station. Simply, 0.05 g catalyst and 0.01 g polyvinylpyrrolidone are dispersed in 3 mL ethanol and 30 μL oleic acid. After full mixing, 0.05 mL suspension is immersed into FTO substrate (1.0 cm^2) as the corresponding working electrode. The Pt electrode is used as the counter electrode, and the Ag/AgCl electrode in saturated KCl solution is identified as the reference electrode.

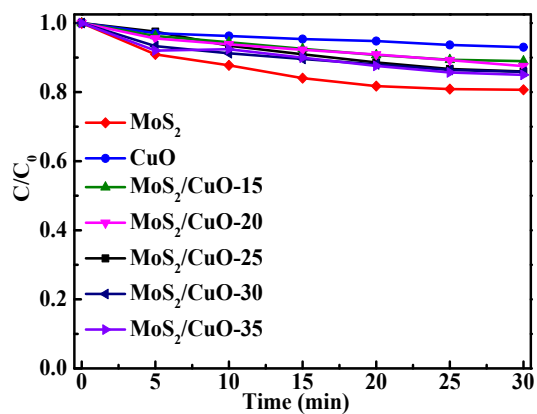


Fig. S1 Adsorption curves of different samples for MBT in dark.

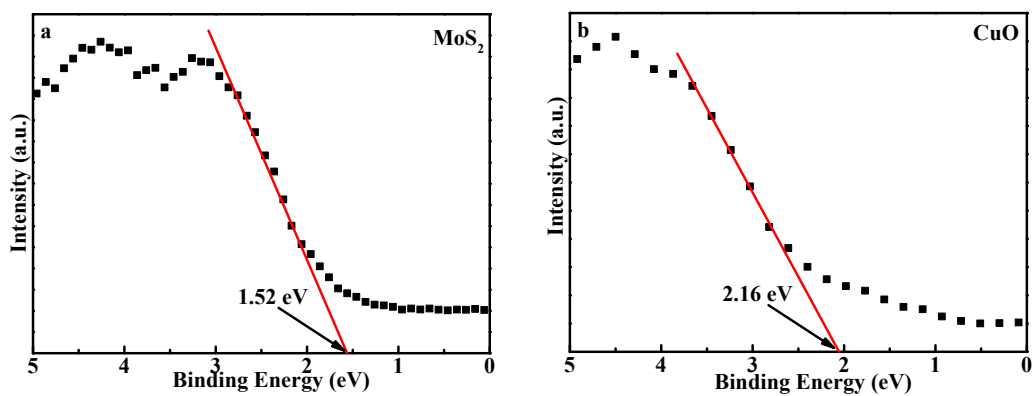


Fig. S2 XPS valence band spectra of MoS_2 and CuO.

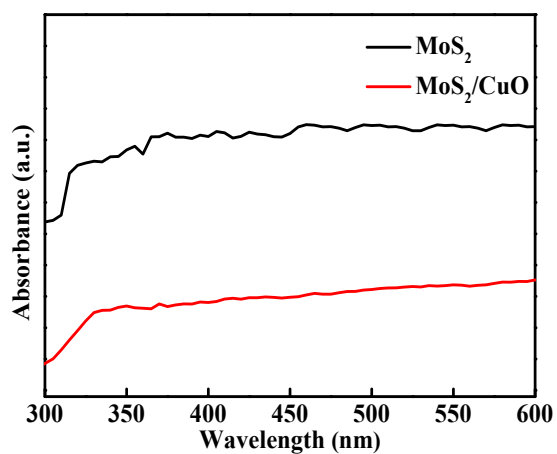


Fig. S3 UV-vis DRS of MoS_2 and MoS_2/CuO .